Multiple Level (ML), Integrated Sector Format (ISF), Error Correction Code (ECC) Encoding And Decoding Processes For Data Storage Or Communication Devices And Systems

Abstract Of The Disclosure

A method and an apparatus encodes and decodes blocks having a predetermined number of sectors of data bytes to detect and correct data bytes in error in each sector of a block. The method and the apparatus generates sector level check bytes for each sector in the block responsive to the data bytes in each sector according to a first level of an error correction code, and generates block level check bytes for a predetermined sector in the block responsive to the sector level check bytes of various sectors, including the predetermined sector, according to at least a second level of the error correction code. The method and apparatus processes the block to detect and correct data bytes in error in each sector within the capability of the sector level check bytes, to detect and correct data bytes in error in the at least two sectors that exceed the correction capability of the sector level check bytes but within the correction capability of the block level check bytes, or to indicate that the data bytes in error in the at least two sectors exceed the correction capability of each of the sector level check bytes and the block level check bytes. The method and apparatus improves signal quality for long streams of information having multiple sequential physical blocks of data bytes, such as audio visual information, with a low check byte overhead while being compatible with conventional 512 data byte sized sectors and conventional single sector error correction code processes.